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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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APPLIED MATERIALS, INC.
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SANTA CLARA, CA 95050

EXAMINER

MOORE, KARLA A

ART UNIT	PAPER NUMBER
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1763

7

DATE MAILED: 07/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/059,572

Applicant(s)

STEVENS ET AL.

Examiner

Karla Moore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-95 is/are pending in the application.
- 4a) Of the above claim(s) 1-18 and 41-95 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 19-27 and 32-40 is/are rejected.
- 7) ☒ Claim(s) 28-31 is/are objected to.
- 8) ☒ Claim(s) 1-95 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,5,6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-18, drawn to a substrate processing apparatus, classified in class 156, subclass 345.23.
 - II. Claims 19-40, drawn to a substrate processing apparatus, classified in class 156, subclass 345.19.
 - III. Claims 41-75, drawn to a substrate processing chamber adapted for electroless deposition, classified in class 118, subclass 728.
 - IV. Claims 76-81, drawn to a substrate processing chamber adapted for electroless deposition, classified in class 118, subclass 722+.
 - V. Claims 82-87, drawn to a semiconductor deposition system, classified in class 118, subclass 719.
 - VI. Claims 88-90, drawn to a substrate chamber adapted for electroless deposition (transducer), classified in class 118, subclass 722+.
 - VII. Claims 91-95, drawn to a multilevel chamber adapted for electroless deposition, classified in class 118, subclass 719.

The inventions are distinct, each from the other because of the following reasons:

1. Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, each of the inventions could be used individually as a substrate processing apparatus without components disclosed in the other subcombination. See MPEP § 806.05(d).
2. Inventions III and I are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the fluid seal is not required to be adapted to

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prevent the flow of a fluid from flowing on a backside of a substrate disposed on the substrate receiving surface of the substrate. The subcombination has separate utility such as in an etching apparatus.

3. Inventions I and IV are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as in an etching apparatus. See MPEP § 806.05(d).

4. Inventions I and V are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as in a single chamber deposition system or in an etching semiconductor system. See MPEP § 806.05(d).

5. Inventions I and VI are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as in an etching apparatus. See MPEP § 806.05(d).

6. Inventions I and VII are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as in an etching apparatus. See MPEP § 806.05(d).

7. Inventions II and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention II has separate utility such as in an etching apparatus. See MPEP § 806.05(d).

8. Inventions II and IV are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention II has separate utility such as in an etching apparatus. See MPEP § 806.05(d).

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9. Inventions II and V are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention II has separate utility such as in an etching apparatus. See MPEP § 806.05(d).

10. Inventions II and VI are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention II has separate utility such as in an etching apparatus. See MPEP § 806.05(d).

11. Inventions II and VII are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention II has separate utility such as in an etching apparatus. See MPEP § 806.05(d).

12. Inventions III and IV are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention III has separate utility such as in an apparatus without a power supply. See MPEP § 806.05(d).

13. Inventions III and V are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention III has separate utility such as in an apparatus with a single deposition chamber. See MPEP § 806.05(d).

14. Inventions III and VI are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention III has separate utility such as in an apparatus without a power supply. See MPEP § 806.05(d).

15. Inventions III and VII are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately

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usable. In the instant case, invention III has separate utility such as in an apparatus without a movable substrate support. See MPEP § 806.05(d).

16. Inventions IV and V are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention V has separate utility such as in an apparatus without a power supply. See MPEP § 806.05(d).

17. Inventions IV and VI are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the power supply could be something other than a transducer. The subcombination has separate utility such as in a chamber adapted for something other than electroless deposition.

18. Inventions IV and VII are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention IV has separate utility such as in an apparatus without a movable substrate support. See MPEP § 806.05(d).

19. Inventions V and VI are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention VI has separate utility such as in an apparatus with a single deposition chamber. See MPEP § 806.05(d).

20. Inventions V and VI I are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention VII has separate utility such as in an apparatus with a single deposition chamber. See MPEP § 806.05(d).

21. Inventions VI and VII are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately

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usable. In the instant case, invention VI has separate utility such as in an apparatus without a movable substrate support. See MPEP § 806.05(d).

22. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

23. During a telephone conversation with Mr. Brian Hrna on 05/21/03 a provisional election was made with traverse to prosecute the invention of Group II, claims 19-40. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-18 and 41-95 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

24. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

25. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

26. Claims 19-25 and 35-36 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,557,785 to Ohkuma.

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27. Ohkuma discloses a substrate processing apparatus in Figure 3A, comprising: an evaporation shield (cover, 12) adapted to be positioned over a substrate (14) disposed on a substrate support (multiple parts, pedestal (11) and fluid filled area between pedestal and substrate; column 3, rows 5-9).
28. With respect to claim 20, the shield is sized to substantially cover the substrate (see Figure 3A).
29. With respect to claim 21 and 22, the evaporation shield comprises a fluid-retaining surface (bottom surface of the cover) adapted to form a fluid filled gap with respect to the substrate (column 4, rows 26-31). The gap is filled with a fluid layer.
30. With respect to claim 23, the shield further comprises at least one port (opening, 20; column 3, rows 53-56) to deliver a fluid to form the fluid layer.
31. With respect to claim 24 and 25, the evaporation shield further comprises at least one port (exhaust opening 21; column 3, rows 57-66) to reclaim the fluid on the substrate.
32. With respect to claims 35 and 36, a seal (o-ring, 22; column 3, rows 44-45) is provided contacting both the substrate support and the evaporating shield for forming a sealed chamber.

Claim Rejections - 35 USC § 103

33. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

34. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkuma as applied to claims 19-25 and 35-36 above in view of U.S. Patent No. 4,821,675 to Ikeno et al.
35. Ohkuma discloses the invention substantially as claimed and as described above.
36. However, Ohkuma fails to teach the evaporation shield/cover adapted to provide heat to the fluid layer.

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37. Ikeno et al. teach the use of an evaporation shield/cover/lid adapted to provide heat to a fluid layer in a substrate processing apparatus for the purpose of restraining temperature variation of the fluid (column 2, rows 40-43 and column 2, rows 65-column 3, row 2).

38. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an evaporation shield/cover/lid adapted to provide heat to a fluid layer in a substrate processing apparatus in Ohkuma in order to restrain temperature variation of the fluid as taught by Ikeno et al.

39. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkuma and Ikeno et al. as applied to claim 26 above, and further in view of U.S. Patent No. 6,039,814 to Ohmi et al.

40. Ohkuma discloses the prior art substantially as claimed and as described above.

41. However, Ohkuma fails to teach the evaporation shield comprising a degassing membrane.

42. Ohmi et al. teach the use of a degassing membrane (film; column 2, rows 58-61) for the purpose of removing gas from a processing liquid, where dissolved gas can result extremely damaged sound waves in a megasonic system and non-uniform processing (column 2, rows 28-40). Ohmi also teaches performing degassing near a use point (evaporator shield) as the most preferable way to remove all gas (column 2, rows 54-57).

43. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an evaporation shield comprising a degassing membrane in Ohkuma et al. in order to remove gas and prevent extremely damaged sound waves and/or non-uniform processing as taught by Ohmi.

44. Claims 32, 33 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkuma as applied to claims 19-25 and 35-36 above, in view of U.S. Patent Publication No. 2003/0116176 A1 to Rothman et al.

45. Ohkuma discloses the invention substantially as claimed and as described above.

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46. However, Ohkuma fails to teach a transducer coupled to/disposed against the evaporation shield to provide acoustic waves to the fluid layer.

47. Rothman et al. teach the use of a transducer (Figure 1, 30) coupled to/disposed against an evaporation shield (Figure 1, 12) for the purpose of generating and transmitting acoustic wave patterns into a medium as means of providing or enhancing a cleaning process (paragraph 15).

48. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a transducer coupled to/disposed against the evaporation shield in Ohkuma in order to generate and transmit acoustic wave patterns into a medium as means of providing or enhancing a cleaning process as taught by Rothman et al.

49. With respect to claim 38, the transducer, which provides agitation, (paragraph 80) is a protrusion from the evaporation shield.

50. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkuma and Rothman et al. as applied to claims 32 and 33 above, and further in view of U.S. Patent No. 6,224,713 to Hembree et al.

51. Ohkuma and Rothman et al. and disclose the invention substantially as claimed and as described above.

52. However, Rothman et al. fails to disclose the transducer comprising a rod which is adapted to contact a fluid layer.

53. Hembree et al. teach mounting a transducer (Figure 5, 28) on a submersible rod (34) to transmit energy from the transducer to a processing solution for the purpose of preventing the need to bring the transducer in direct contact with the solution (column 5, rows 49-53).

54. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a submersible rod for mounting a transducer in the Rothman et al. in order to prevent the need for bringing the transducer in direct contact with a processing solution as taught by Hembree et al.

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55. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkuma as applied to claims 19-25 and 35-36 above in view of U.S. Patent No. 6,027,602 to Hung et al.

56. Ohkuma discloses the invention substantially as claimed and as described above.

57. However, Ohkuma fails to teach the evaporation shield adapted to rotate.

58. Hung et al. teach rotating an evaporation cover (cover, 59) with a chamber (50) and a substrate (52) for the purpose of creating a stable processing environment where processing parameters are more easily controlled (abstract).

59. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a evaporation shield adapted to rotate in Ohkuma in order create a stable processing environment where processing parameters are more easily controlled as taught by Hung et al.

60. Claims 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkuma as applied to claims 19-25 and 35-36 above, in view of U.S. Patent No. 3,853,094 to Christini et al.

61. Ohkuma disclose the invention substantially as claimed and as described above.

62. However, Ohkuma fail to teach the evaporation shield comprising polymeric material.

63. Christini et al. teach using a polymeric material when constructing a processing apparatus to take advantage of the corrosion resistance properties of polymers (column 7, rows 37-42).

64. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the evaporation shield comprising polymeric material in Ohkuma in order to take advantage of the materials anti-corrosion properties as taught by Christini et al.

Allowable Subject Matter

65. Claims 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

66. The following is a statement of reasons for the indication of allowable subject matter: Ohkuma, the closest piece of prior art, fails to teach or fairly suggest a plenum in communication with the

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degassing membrane. Nor, does any other piece of art provide motivation for the addition of the structure as claimed to the invention of Ohkuma.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9310 for regular communications and 703.872.9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km
June 27, 2003

Primary Examiner
AU 1763
P. Hasenzer